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OKC 3601
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20 JUN 1962

MEMORANDUM FOR THE RECORD

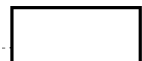
SUBJECT: Trip Report (MECEN and SAC Operations, 14 June 1962,

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1. The primary objectives of the trip were to:
 - a. Visit Weather Central to determine the extent of assistance available in the Electronic Data Processing (EDP) field.
 - b. Visit SAC Operations people (on an informal, personal basis) to determine the nature of their EDP flight planning program and its availability.
2. Weather Central
 - a. Personnel contacted were:
 - Col. C.A. Spahn, Chief, MECEN
 - 1st. Col. R. Rogers, GIC Computer Programming
 - 1st. Col. J.J. Allen, Chief, Special Projects
 - Maj. J. Smith, Major Wise's planned replacement
 - b. Equipment
 - (1) IBM 7090: This is their major computer with a 32,000 instruction storage capacity.
 - (2) IBM 1401: This is a small computer of 4000 instruction capacity and is an auxiliary to the 7090.
 - c. Capabilities
 - (1) Their EDP program incorporates all the tremendous number of reporting sources, plus many other inputs and produces a weather forecast (climatological or actual) within fifteen minutes.

USAF review(s) completed.

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(a) Present data is available to 30M, but expansion of their program is in process to go to 70M and eventually to 102M.

(b) Presently extrapolation is used to reach altitudes of interest to GFB programs.

(c) Wind information is limited to 300M, world coverage.

(2) Mechanics of Transmission

(a) A request to WECAN may be in the form of TWX, phone voice, or placed on TWX cable by cutting a paper tape on an IBM 047 (\$160.00 per month). This TWX circuit will produce a paper tape at WECAN. This tape is then used in an IBM 061 (\$125.00 per month) to produce IBM cards which are input for either ILL computer.

d. Specific Points of Interest

(1) WECAN outputs for flight planning are flight level winds and temperatures. These are usually produced in 250 IM increments but are available in any desired distances.

The outputs, usable in FLIOP (Flight Planning) is in the form of a deck of IBM cards furnished to the Operations Planners.

The usual sequence of planning is:

(a) Route is developed by SAC Operations, no wind.

(b) Metro climatology (historical data) is furnished by WECAN's Computer Program (within fifteen minutes).

(c) SAC Ops applies climatology to the no wind flight plan for feasibility.

(d) Ops requests forecast type metro prior to execution to apply to the metro flight plan.

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(2) WECEN is programmed to accept large volumes of requests for flight planning weather information and is producing machine runs of SAC Ops flight plans with metro weather applied (see Attachment #1).

(3) Colonels Allen and Rogers both strongly recommended that a flight planning program be planned for a computer of the 7090 size rather than to accept the limited size of a machine such as a 1401. Further growth in fields such as command and control or intelligence would probably be restricted unless a machine of sufficient capacity was chosen initially.

(4) Standard day temperatures are used in SAC's FLIOP. Programming is now possible to insert climatological temperatures into the planning program to give a more accurate TWS on which to base elapsed time. This point was strongly recommended by Col. Allen.

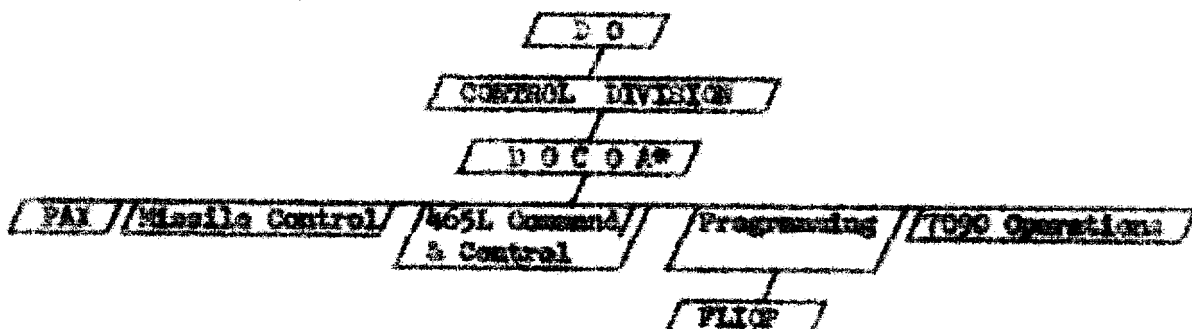
(5) Col. Allen offered programmer assistance by Air Weather Service and urged we consider an early meeting in our area to discuss this. He recommended Capt. Earl Kindell at Weather Service Headquarters as being available for use in initial programming assistance. Some of this assistance would be available on an extended time basis, however.

3. SAC Operations

a. Personnel contacted were:

Lt. Col. Twickey, OIC Programming
Captains Sills and Hughes, FLIOP Programmers

The location of these people in the chain of command is as follows:



* Directorate of Operations, Control Division, Automation Branch.

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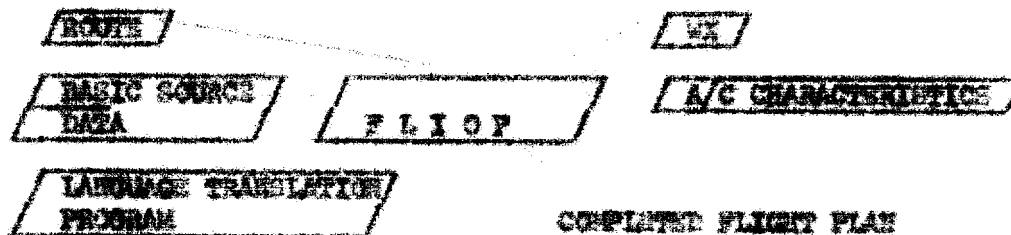
The actual detailed flight plans for all the various divisions (H-0 or peacetime) are produced by the "FLIOP Section" within the Programming Section.

b. Capability

(1) The original FLIOP (then FLCP) which was developed in 1959 with RAND assistance has been modified extensively to suit specific SAC requirements. During this period considerable logic detail has been lost, and the degree of dependence on personal knowledge and familiarization with the program by the three men involved is disturbing.

(2) The result of the FLIOP machine program is a detailed flight plan as illustrated by Attachment #2. The base program accepts input variables of:

- (a) Aircraft performance parameters.
- (b) Routes.
- (c) Weather.
- (d) Expandables.
- (e) Profile (speed and altitude - optimum/low)
- (f) Refueling information.



(3) Presently SAC flight plans the following:

B-32
B-47
B-58
KC-135
KC-97
A-43

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4. Trip Conclusions

a. Weather inputs are available and present no problem - either from albatology, wind/temperature, or visibility conditions.

b. The FLICP program is extremely sophisticated to fit SAC's requirements. The logic background is not readily available and considerable programming effort will be required to adapt (simplify) FLICP for our use.

c. Access to both WSOEN and SAC Operations is no problem (on the working level). Capt. Bills invited us to come for a week and he would teach us to create KC-135 flight plans!

d. The FLICP program is written in IBM 7090 language, and if a 7090 is not available it would have to be rewritten for any other computer.

e. The "Principle of Growth" must be accepted. When computer capability is established, additional valuable capabilities are developed in such areas as intelligence, weather, and control. Machine capacity should be such a size to accept this growth.

5. Recommendations

a. An RIF Section be established within the OICANT Operations Branch. Three people should be assigned to this branch as follows:

- 2 RIF machine programmers.
- 1 Operations Staff Officer.

b. Recruitment of the programmers should be commenced at once. It is strongly recommended that 1/Lt. Robert E. Brann be considered as he is completing 3 years at SAC in FLICP and is Mr. FLICP at present. He is presently job hunting in the East (desires to live on East coast) and can probably command a salary of approximately \$700.00/month. If he could be made available, our OICANT programming problem is solved and the continuation and operation of the RIF program will be assured.

c. Location of computer facilities is of course of primary consideration and IBM 7090 should be our first consideration. RCA 490 facilities can be used with reprogramming. IBM 1401 will

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restrict us and should not be considered for the basic FLICP program.

d. [] should now be establishing the exact format of the information they will require for staff and pilot use. It must be remembered that the basic program should be written to accept format changes as we learn.

e. Time phasing must consider the following:

Recruitment of programmer	90 days -	3 months
Program Re-writing		5 months
Final Phase testing and CPX type activity		2 months
TOTAL:		10 months

It may be seen that programming action must be initiated shortly if an EDP capability is to be in place 1 April 1963.

SIGNED

[]
DFD/CPX/CRG

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DFD/CPX/[] (19 June 62)

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